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Analysis of KRAS2 Gene Mutations in Colorectal Cancer Patients in Malaysia

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Abstract

Colorectal cancer (CRC) is a common cancer and the second leading cause of cancer death in the Western world. It is the commonest cancer among men and the third most common cancer among women in Malaysia. Previous studies have reported 43% of colorectal cancers have KRAS2 gene mutation. KRAS2 (Kirsten-ras) gene is oncogene group which is located on chromosome 12p12 and has an important role in the Ras/MAPK signaling pathway. Its mutations on codon 12 will raise 30% the risk of recurrence or death, and are correlated 50% to increasing risks of recurrence or death in Duke's C colorectal cancers. The aim of this study was to analyze KRAS2 gene mutation in Malaysian Colorectal cancer patients.

Tumor and normal tissues were collected from 75 patients admitted to UKM Medical Center. DNA from 25 mg tissue was extracted by QIAamp DNA kit. KRAS2 gene was amplified using PCR and the mutation was detected using dHPLC and Sequencing.

Seventy five patients with colorectal cancer involved in this study; i.e. 53.3% (n=40) females and 46.7% (n=35) males. Most of the patients are Chinese (62.7%) compared to Malays (33.3%) and Indian (2.7%). Mutation of KRAS2 gene was detected in 46.7% (35/75) of the CRC patients. On affected male mostly diagnosed at younger age, while on female at older age with significant correlation $p=0.046$. A significant correlation was found in patients with familial history and KRAS2 gene mutation status ($p=0.003$) and early age of onset ≤ 50 years old ($p=0.022$).

The determination of KRAS2 gene status in colorectal cancer patients is important especially for colorectal cancer in early age of affected male, and also in familial cases. Familial cancer screening of younger patients is needed for early management and counselling strategies.

Keywords: KRAS2 gene mutation, colorectal cancer